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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/532,586

Filing Date: June 17, 2005

Appellant(s): SAITO ET AL.

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Amy Scmid  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed July 10, 2009 appealing from the Office action mailed December 10, 2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

JP 2000-071164

Higuchi et al.

03-2000 (translation in

		electronic file dated 6/13/06)
JP 11-350200	Noguchi et al.	12-1999 (translation in electronic file dated 6/13/06)
JP411329896	Yoneda	11-1999 (translation in electronic file dated 11/13/07)
2951096	Miller	8-1960
2002/0093002	Tsuchiya et al.	7-2002

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 4-11 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higuchi et al. (previously cited) and Noguchi et al. (previously cited) in view of Yoneda (cited by applicant) and Miller (2951096).

In reference to claims 1, 8, 9, 11 and 17, Higuchi et al. and Noguchi et al. as mentioned in the applicant's specification disclose the known process of surface treating an inner surface of a vacuum member by first mechanically polishing the vacuum member with a liquid medium containing hydrogen atoms, than subjecting the vacuum member to a chemical or electrochemical polishing process that includes an oxidizer (i.e. water) (see applicant's specification, pages 3-6 or Paragraph 4, of Noguchi et al. or Paragraph 6 of

Higuchi et al.). Higuchi et al. and Noguchi et al. also teach that an oxidizing material that could be added to the liquid medium (see paragraph 6, of Higuchi et al.) and that the vacuum member is made from niobium (see specification, page 4, Lines 1-4), however, Higuchi et al. and Noguchi et al. lack, a liquid medium absent of any hydrogen atoms, said liquid medium being a saturated hydrocarbon in a molecule of which the hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms. However, Yoneda teaches of providing a solution intermingled with a polishing medium (Paragraph 8), said non-aqueous solution being formed from various types of fluorocarbons (Paragraph 12). Also, Miller teaches that perfluorocarbons can be formed from saturated or unsaturated hydrocarbons (Column 1, Line 32) at various temperatures (Column 3, Lines 47-49) and pressures. (Column 4, Lines 1-5), since perfluorocarbons are examples of fluorocarbons which have had all their hydrogen atoms replaced by fluorine atoms the examiner believes the limitations of the claims have been met. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the liquid medium used in the known process, of Higuchi et al. and Noguchi et al. with a liquid medium formed as a saturated hydrocarbon under ordinary pressure and ordinary temperature wherein the hydrogen atoms are replaced with fluorine atoms, as taught by Yoneda and Miller, in order to provide non-aqueous liquid that is non-flammable and explosion proof thereby more effectively and safely carrying out a polishing process. Assuming *arguendo*, that Miller does not teach a saturated hydrocarbon at a ordinary temperature and pressure, since it has been held that where the general conditions of a claim are disclosed in the prior

art, discovering the optimum are workable ranges involves only routine optimization and experimentation to one of ordinary skill in the art. *In re Aller*, 105 USPQ 233. In this situation, one could select the temperature and pressure to be any level according to the desired characteristics needed by the user to accomplish the intended task.

In reference to claims 4 and 5, Higuchi et al. and Noguchi et al. as mentioned in the applicant's specification disclose that the vacuum member is made from niobium (see specification, page 4, Lines 1-4 or Paragraphs 18 and 19 of Higuchi et al.) and is a superconducting accelerating cavity (see specification, page 4, Lines 1-4).

In reference to claims 6, 7 and 10, Higuchi et al. and Noguchi et al. also disclose an oxidizing material formed as water, which could be added to the liquid medium (see paragraph 6, of Higuchi et al.)

In reference to claims 18 and 19, Noguchi et al. teach of including nitric acid in the composition (Paragraph 8).

Claim 19, is also rejected under 35 U.S.C. 103(a) as being unpatentable over Higuchi et al. (previously cited) in view of Noguchi et al. (previously cited), Yoneda (cited by applicant), Miller (2951096) and Tsuchiya et al. (2002/0093002). Assuming *arguendo*, that Higuchi et al. and Noguchi et al. disclose the claimed invention previously mentioned above, but lack, an oxidizing agent formed as nitric acid.

However, Tsuchiya et al. teach that it is old and well known in the art to provide an oxidizing agent with nitric acid (Paragraph 38). One of ordinary skill in the art could have applied the known technique of having an oxidizing agent formed with nitric acid, as taught by Tsuchiya et al., in the same way to the device, of Higuchi et al. or Noguchi et al., and the results would have been predictable. In this situation, one could provide a polishing medium having increased accuracy and efficiency.

#### **(10) Response to Argument**

Appellant contends on Page 10, of the appeal brief that, **“As mentioned above, the Examiner admits the neither Higuchi nor Noguchi describe the liquid medium used in Appellants' claimed process, i.e., a liquid medium including no hydrogen atom, wherein the liquid medium is a saturated hydrocarbon in a molecule of which the hydrogen atom(s) are all substituted with fluorine atom(s). The Examiner relies on Yoneda as teaching the combination of a non-aqueous solution intermingled with a polishing medium, wherein the non- aqueous medium is formed from various types of fluorocarbons. However, the Yoneda reference does not teach a compound wherein all of the hydrogen atoms have been replaced with fluorine atoms. In fact, Yoneda teaches such compounds as hydrofluoroether and hydrofluorocarbon, which clearly include hydrogen substituents.”** However, the examiner respectfully disagrees with this statement. Yoneda teaches of using fluorocarbons which by definition have had all the hydrogen atoms replaced by fluorine atoms, which is disclosed in (Column 1, Lines 34-38) of

Yoneda. In addition the definition according to Dictionary.com discloses fluorocarbon as being the following:

**fluor-o-car-bon**

n. An inert liquid or gaseous halocarbon compound in which fluorine replaces some or all hydrogen molecules, used as aerosol propellants, refrigerants, solvents, and lubricants and in making plastics and resins.

Clearly, all the hydrogen atoms are replaced therefore the examiner believes the rejection is proper and thus maintained.

Appellant contends on Page 11, of the appeal brief that, **“The Examiner appears to acknowledge that Yoneda fails to teach a compound wherein all of the hydrogen atoms have been replaced with fluorine atoms, as the Miller reference is relied upon to demonstrate that fluorocarbons exist, wherein all of the substituents are fluorine atoms. However, the Examiner has not explained why one would look from the teachings of Higuchi and Noguchi to the teachings of Yoneda or Miller.”** However, the examiner respectfully disagrees with this statement. In the rejection above the examiner has clearly stated why one could look to the teachings of Yoneda and Miller, which again could provide a non-aqueous liquid that is non-flammable and explosion proof thereby more effectively and safely carrying out a polishing process therefore the examiner believes the rejection is proper and thus maintained.

Appellant contends on Page 12, of the appeal brief that, "Appellant contends on Page 11, of the appeal brief that, **"Furthermore, Miller merely teaches that there exists a saturated or unsaturated fluorocarbon compound in which all of the substituents are fluorine atoms. However, this fact alone does not justify combining Miller with the primary references (Higuchi and Noguchi). Additionally, Miller discloses in column 2, lines 22-28 that "[a]nother object of this invention is to devise a convenient and effective synthesis ..., the perfluorocarbons and perfluorochlorocarbons especially after further treatment to saturate the unsaturated bonds present with fluorine or chlorine, being useful as lubricants where reactive substances are present."** (Emphasis added.) One of ordinary skill in the art would understand that lubricants prevent or decrease friction. On the contrary, the mechanically polishing step recited in Appellants' claims needs or makes use of friction. Thus, the Miller reference teaches away from Appellants' claimed method, and certainly cannot be relied upon as motivation to use the compound of Miller as a liquid medium in mechanical polishing. Thus, Miller fails to teach not only the element of "mechanical polishing", but also the element of "a vacuum member". In view of the above, Appellants respectfully assert that, absent the use of Appellants' own disclosure, one skilled in the art would not have combined the references in the manner suggested by the Examiner. Appellants have studied the Miller reference quite extensively, in order to try to understand the outstanding rejections. As a result of this study, Appellants found that there is neither motivation nor a reason to combine the cited references,

**absent the knowledge found in Appellants' disclosure."** However, the examiner respectfully disagrees with this statement. Miller was used as a general teaching that it is known in the art to form a saturated or unsaturated fluorocarbon compound. The particular problem being addressed between the references is using a fluorocarbon compound therefore the technical problem between the references is similar. The fact that Miller does not disclose the other elements as claimed by the appellant is moot because these elements were not taken in the combination only the teaching that it is known in the art to form a saturated or unsaturated fluorocarbon compound. It appears that the appellant has considered each reference individually rather than taking each reference for what they teach and considering the combination as a whole therefore the examiner believes the rejection is proper and thus maintained.

Appellant contends on Page 13, of the appeal brief that, "Appellant contends on Page 11, of the appeal brief that, **"Furthermore, Appellants' invention exhibits unexpected and surprising effects compared to Higuchi, which is the closest prior art. Specifically, Appellants' invention unexpectedly suppresses the occlusion of hydrogen as a solid solution into an inner surface of the vacuum member, not only during mechanical polishing, but also during electrolytic polishing following the mechanical polishing. Due to the suppression of hydrogen occlusion, a superconducting accelerating cavity having a high performance can be made successfully, thus rendering unnecessary vacuum annealing after the polishing. Please see page 6, lines 15-22 of Appellants'**

**specification. The unexpected and surprising effects of Appellants' invention are achieved by adopting a liquid medium including a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms when the vacuum member is formed and polished. These results would not have been expected by those of ordinary skill in the art at the time of Appellants' invention.**" However, the examiner respectfully disagrees with this statement. While the applicant provides a statement of unexpected results the combination would also create this effect therefore it is the opinion of the examiner that the evidence does not outweigh the obviousness combination. Even though the motivation is different from the appellant's motivation one could still combine the references above in order to provide a non-flammable and explosion proof solution thereby more effectively and safely carrying out a polishing process, therefore the examiner believes the rejection is proper and thus maintained.

Appellant contends on Page 14, of the appeal brief that, "Appellant contends on Page 11, of the appeal brief that, **"Thus, Appellants' invention unexpectedly suppresses the occlusion of hydrogen as a solid solution into an inner surface of the vacuum member, not only during mechanical polishing, but also during electrolytic polishing following the mechanical polishing. Due to the suppression of hydrogen occlusion, a superconducting accelerating cavity having a high performance can be made successfully, thus rendering unnecessary vacuum annealing after the polishing. The unexpected and surprising effects of**

**Appellants' invention are achieved by adopting a liquid medium including a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms when the vacuum member is formed and polished. These results would not have been expected by those of ordinary skill in the art at the time of Appellants' invention.”** However, the examiner respectfully disagrees with this statement. With the rejection above one would also provide a medium including a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms when the vacuum member is formed and polished therefore the examiner believes the rejection is proper and thus maintained.

Appellant contends on Page 16, of the appeal brief that, “Appellant contends on Page 11, of the appeal brief that, **“Lastly, Dr. Tamao Higuchi, who is one of the inventors of the present application, won the highest award for young researchers' presentation on the subject of the claimed invention at the 11th International Workshop on Superconducting Radio Frequency (SRF-2003), held at Travemunde, Germany, September 8-12, 2003. Please see the enclosed Japanese document regarding this award, together with its verified English translation and an English explanation of the relevant parts provided by Dr. Higuchi. The award of this prize is further evidence of the novelty and unobviousness of the claimed subject matter.”** However, the examiner respectfully disagrees with this statement. The declaration submitted by Dr. Higuchi does not outweigh the obviousness combination.

One could still look to the teachings of Miller or Yoneda for replacing hydrogen atoms with fluorine atoms to provide a medium including a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms when the vacuum member is formed and polished therefore the examiner believes the rejection is proper and thus maintained.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Robert Scruggs

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